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SECTION 800.00 – PLANS

SECTION 805.00 - INTRODUCTION

The Idaho Transportation Department produces plan sheets for several purposes such as for design information, construction bidding documents, historical information, legal records of survey, or departmental records. The following information explains typical plan preparations and organization that is needed to produce a set of plans that is constructible with clarity. Variations to these instructions require approval by Roadway Design. [Appendix C](#) contains specific plans, drawings, examples, etc., that can be followed when preparing project plans.

SECTION 807.00 – PLAN SHEETS

The following information is specifically for preparing project plan sheets for the Idaho Transportation Department. The plan sheets should include, in the necessary detail:

- All construction features required to complete the project;
- All right of way details;
- Items to be removed;
- New items to be constructed, etc.

Special detailed drawings may be required to clarify construction details or nonstandard items included in the project.

All plan sheets should be developed on ITD's Computer-Aided Design and Drafting (CADD) system. Those plan sheets that cannot be produced using the CADD system or that were produced before the system was available shall be scanned and stored on the CADD system. Those plan sheets produced outside of ITD shall be in a format compatible with the CADD system.

All projects will have English units throughout. Mixed (English/metric) or dual dimensions will be allowed on right of way plans only.

Some necessary details for preparing project plan sheets may not be covered in these procedures. If questions arise on the amount of detail or appropriate format, other similar project plans should be reviewed for examples or check with the Roadway Design section. A continuous effort should be made to simplify and clarify the project plans through discussions with the construction personnel.

The following information describes the general size, layout, and format for plan sheets.

807.01 Plan Sheet Size. ITD prepares plan sheets for design and construction in three sizes, as defined in the table below. The drawing details should not be crowded on the plan sheet. Do not use small size lettering which is too small to read on standard size prints.

PLAN SHEET DIMENSIONS (ENGLISH)				
Type	Sheet Size (mm)	Left Edge Border (Binding)	Other Borders	Title Block
Standard Size	11" x 17"	¾"	¼"	16"
Record of Survey	18" x 27"	3"	½"	23 ½"
Maintenance Project	8 ½" x 11"	1"	¼"	N/A

PLAN SHEET DIMENSIONS (METRIC)				
Type	Sheet Size (mm)	Left Edge Border (Binding)	Other Borders	Title Block
Standard Size	279 x 432	20 mm	6 mm	406 mm
A3 (ISO)	297 x 420			
Record of Survey	457 x 686	89 mm	13 mm	597 mm
Maintenance Project	216 x 279	25 mm	6 mm	N/A
A4 (ISO)	210 x 297			

All final plan sheets submitted for advertisement shall be properly endorsed by the engineer. They shall be on a durable medium such as mylar to preserve the drawings for archival purposes.

807.02 Plan Sheet Title Block. All plan sheets shall use the ITD title block designed for that specific sheet. The title block shall have all the necessary information shown in its appropriate place. Changes to the title block may be made with the approval of the Roadway Design section. The following describes the basic information in a standard title block.

Revisions

The revisions section is only for changes to the plan sheets after they have been stamped and endorsed by the engineer. Each change should be marked with a triangle and numbered successively. In the revisions box the triangle shape should be marked with the corresponding number of the plan sheet change and a date, the initials of the person making the revisions, and a description of the revision entered in the appropriate place. Each different change should be entered on a new line. Entries in this box should primarily be made by the Roadway Design section.

Preparer's Names

Enter the names of the designer, the person who checks the design, the detailer, and the person who checks the drawing, whenever appropriate.

CADD File Number

File Name: A standard electronic file naming convention is used by ITD for the naming of plan sheets to be retained and archived. As a minimum the name must begin with the key number of the project and have the .DGN extension. A full name should be used that follows the example shown below:

<u>2659</u>	<u>RD001</u>	<u>.DGN</u>	
Project Key No.	Sheet Designator		Extension

Project Key Number: The key number for the project as identified in the Highway Development Program. All project-related electronic file names should begin with the key number.

Sheet Designator: The sheet designator number of the drawing or if it is a summary sheet, the sheet type and a consecutive numbering system. Consult CADD procedures for more details of the numbering system.

Date

Enter the date the drawing is completed, which is usually when the last corrections are made for Final Design or Contract Advertising submittal.

Section Name

The section name box is directly below the ITD name and seal and is for the area section name, or the consultant may place their business name within this box. Appropriate names would include the district and section, such as “District 6 Design” or “Headquarters Traffic Section.”

Federal-Aid Project Number

On the title sheet only, for federal-aid projects it may be necessary to show two or more project numbers when right of way and construction are handled under separate project numbers. Show the construction project number **only** on all other sheets.

If it is a state project, show the project number in this box .

Sheet Title, Project Name, and Description Box

A sheet title consisting of the type of sheet it is should be shown for each sheet. The names should generally coincide with those shown in the index.

The large box below should generally have the project name, but may include additional information such as sheet station limits, structure numbers, intersection names, and other brief identifying descriptions.

Metric Symbol, County, Key Number, Sheet Number

The top box is generally open but may contain the catalog number or the ITD sheet number for a particular sheet. The metric symbol should appear here. If the design has not been prepared in metric units, the symbol may be replaced by the catalog number or by other information. The second box should show the county or counties in which the project is located. The third box should show the project key number. The bottom box is for sheet numbering.

Engineer's Endorsement Space

The endorsement by the engineer must be on a standard size plan sheet. Full size electronic representations of the engineer's stamp shall be used on standard size plan sheets (see [Section 910.01](#)).

807.03 Order of Plan Sheets

Roadway Group

Title Sheet
Standard Drawing Index
Vicinity Sketch
Total Ownership Map
Special Maps
Project Clearance Summary
Typical Sections
Summaries
Roadway
Bridge
Pipe Culvert
Pipe Siphon
Irrigation Pipe
Sewer Pipe
Pipe Underdrain
Plan and Profile Sheets

Special Drawing Group

Sediment and Erosion Control
Minor Structures Drawings
Drainage Plans
Paving, Concrete Joint, Approach Slab Details
Roadside Development and Landscaping Plans
Bike Lanes and Pedestrian Path Plans
Source Plat and Reclamation Plans

Traffic Group

Illumination Materials List
Illumination Plans
Traffic Signalization Materials List
Traffic Signal Plans
Railroad Signal and Crossings
Signing Erection Specifications
Signing Plans
Pavement Marking
Delineation and Raised Channelization
Traffic Control Plans

Utility Group

Optional separate numbering

Right of Way Group

Optional separate numbering

Major Structure Group

Optional separate numbering

Bridge (Situation and Layout)

Optional separate numbering

State Maintenance Group

Optional separate numbering

Standard Drawings

Detail sheets shall be located directly after the plan sheets to which they are related.
--

807.04 Plan Sheet Scales. Drawing scales are expressed in non-dimensional ratios, as used in U.S. Geological Survey topographic maps. Instead of relating map distance in inches to ground distance in feet, they compare like units — feet to feet or inches to inches (meters to meters or millimeters to millimeters). For instance, at a scale of 1"=40' on the drawing represents 1 x 40 = 40 feet, 5 inches on the drawing represents 5 x 40 feet (which is also 200 feet). [1:500, 160 millimeters on the drawing represents 160 x 500 = 80,000 millimeters on the ground (which is also 80 m)].

The following plan sheet scales shall be used on all drawings for the Idaho Transportation Department. Scales smaller than those shown can be used only by request to the Roadway Design Engineer.

Roadway Plan/Profile(ENGLISH)

	Horizontal	Vertical
Urban project scales	1" = 40'	1" = 4'
Rural project OR If complex detail is not necessary	1" = 100' 1" = 200'	1" = 10' 1" = 2'

Roadway Plan/Profile (METRIC)

	Horizontal	Vertical
Urban project scales	1:500	1:50
Rural project OR If complex detail is not necessary	1:1000 1:2000	1:100 1:200

Pavement Marking Plans(ENGLISH)

	Horizontal
Intersection improvement projects that include transitions and/or special details	1" = 40'
The minimum scale for pavement marking plan sheets that do not include transitions or special details	1" = 40'

Pavement Marking Plans (METRIC)

	Horizontal
Intersection improvement projects that include transitions and/or special details	1:500
The minimum scale for pavement marking plan sheets that do not include transitions or special details	1:500

Signal Plans(ENGLISH)

	Horizontal
Traffic sign intersection plans	1" = 40'

Signal Plans (METRIC)

	Horizontal
Traffic sign intersection plans	1:400

The District shall complete, as far as possible, an ITD-1753, Project Clearance Summary, prior to submittal of plans. The Roadway Design section will aid the District in obtaining dates and will enter those dates that become available after the District's submittal.

The approval of access control for the project shall also be shown on the ITD-1753. Access approval is indicated on the most recent [ITD-606](#), Access Control Determination.

The ITD-1753 has a column for "Expiration Date" of clearance approvals. The clearances of other agencies such as the Army Corps of Engineers or Water Resources environment re-evaluation should be noted if their approval has a limited time schedule. This notation will assist the Resident Engineer in either meeting the required dates or requesting a time extension. Notes and estimating data may be placed on the right side blank column of this sheet.

SECTION 810.00 – PLANS AND DRAWINGS

The foot shall be the basic unit for all plans and drawings and is also the basic unit on the CADD system, with 100 subunits and 10 positional units per subunit.

810.01 Dimension Units. On English project plans, common practice is to show all dimensions in feet with the unit symbol shown.

On some standard drawings, bridge plans, and other detail drawings, it may be more practical to use the inch as the basic unit. In such cases, include a note stating that "All dimensions on this sheet are in inches unless otherwise noted" and show the " " symbol.

810.02 Accuracy. Measurements or dimensions shall be shown to the nearest foot, tenth of a foot, or hundredth of a foot. Avoid showing dimensions to two decimal places. Always consider the acceptable tolerance in construction practices and product dimensions when deciding what level of accuracy to use.

810.03 Station. For ITD, the station is defined at 100 feet. Station labeling will follow the standard nomenclature, using a plus sign (+) to separate the station number and the distance past that station.

12+40 (1240 feet from 0+00) **or**
2+65.78 (265.78 feet from 0+00)

Depending on the scale, stationing labels and major tick marks typically shall be shown for every 5 station (every 500 feet). Minor tick marks shall be shown every 100 feet. Depending on the required level of accuracy, station callouts may be to the nearest whole foot, tenth of a foot, or hundredth of a foot. (two significant figures following the decimal point). Features such as culverts or approaches may be shown to the foot or tenth of a foot. Control points and property lines must be shown to the hundredth.

810.04 Curves. Horizontal curves shall be described by the Degree of curve. Vertical curves are shown by length and designed to the nearest 100 Feet.

810.05 Angles. Angles will be shown in degrees, minutes, and seconds.

810.06 Culverts. Culvert diameters will be shown in inches according to the sizes available from suppliers. Culvert lengths will be to the nearest foot.

810.07 Standards and Manuals. The Standard Drawings are available in both metric and English units. The sheets are identically numbered, but there is an "(m)" added at the end to denote metric drawings.

SECTION 813.00 – STANDARD FEATURE LEVELS AND SYMBOLS

The standard symbols to be used on project plans are indicated on Std. Drawing S-1. These figures show the size, line weight, and CADD level assignment and color for each standard symbol. The standard symbols indicated in the figures are stored in the CADD system for reference and use. All plans shall be constructed according to the numerical level of assignment for mapping and general engineering features that are summarized in numerical order on [Figure 8-1](#).

Figure 8-1

CADD EQUIPMENT LEVEL OF ASSIGNMENT FOR MAPPING AND GENERAL ENGINEERING FEATURES

PHOTOGRAMMETRY	1	Mapping, premark and photo center
DATA COLLECTOR	2	Data Collector Text
	3	Inroads Misc. (Triangles, Slope Vectors, Break Lines, etc.)
HYDROGRAPHY (Existing)	4	Marshland, rivers, creeks, lakes, reservoirs, canals, ditches, wetlands
VEGETATIVE SURFACE COVER (Existing)	5	Trees, bushes, tree & brush boundaries, cultivation boundary, stumps, outcropping
CULTURAL FEATURES (Existing)	6	Buildings, foundations, fences, gates, cattle guards, roads, overpasses, underpasses, bridges, urban & rural approaches, curb & gutter, sidewalks, guardrail, mailboxes, signs, traffic signals, luminaires delineators, retaining walls

**CADD EQUIPMENT LEVEL OF ASSIGNMENT FOR
MAPPING AND GENERAL ENGINEERING FEATURES**

UTILITY FEATURES (Existing)	7	Pipelines (gas, oil & water), utility manholes, wells, fire hydrants, meters, valves, risers, underground cable & conduit, utility poles, junction boxes
STATE PLANE COORDINATES	8	Mapping grid ticks, state plane coordinates
MATERIALS & MISCELLANEOUS UNKNOWN OBJECTS (Existing)	9	Stockpiles, material sources, and unknown objects from mapping
DRAINAGE & STRUCTURES (Existing)	10	Pipes (including arches & siphons), catch basins, manholes, embankment protector, minor structures, underdrains, pipelines (sanitary, storm & irrigation)
LAND SURVEY CONTROLS	11	Section & quarter section corners; township & range lines; section, quarter & sixteenth lines, and appropriate text
BROKEN CONTOURS (with Elevations)	12 13	Index or Major Intermediate or Minor
SPOT ELEVATIONS	14 15	Mark for elevation Text for elevation
RAILROAD (Existing)	16	Railroads, railroad protective devices & switches
BOUNDARIES	17	Municipal, city, county, state line, forest, administrative
STRUCTURE OUTLINES (Proposed)	18 19	Bridge (outline of deck, wings, parapets, etc.) Box & stiff-leg culverts (outline of deck, wings, footings, etc.)
STRUCTURE CONTROLS (Proposed)	20 21	Structure control of centerline of abutments, bents, etc. Major component control of centerline of girders, bearings, etc.
MAJOR COMPONENT OUTLINE (Proposed)	22	Outline of girders, footings, abutments, etc.
METAL REINFORCEMENT (Proposed)	23 24	Uncoated Coated
STRUCTURE DIMENSIONS	25	
STRUCTURE NOTES	26	
(Not Assigned)	27 28 29	
BUILDING (Proposed)	30	
BORDER SHEET	31	Cells, titles, legend, and appropriate text
ALIGNMENTS & TYPICAL SECTION (Existing)	32	"G" Alignment & Surface O, groundline, typical sections
ALIGNMENTS & TYPICAL SECTION (Proposed)	33	Horizontal and vertical alignments, sub-subgrading, benchmarks, limit of slopes, roads, railroads, typical sections
PROPERTY OWNERSHIP (Existing)	34	Property ownership, R/W, R/W markers, R/W data, access control
PROPERTY OWNERSHIP (Proposed)	35	R/W, R/W markers, R/W data, easement lines, access control

**CADD EQUIPMENT LEVEL OF ASSIGNMENT FOR
MAPPING AND GENERAL ENGINEERING FEATURES**

DETOURS (Proposed)	36	Alignments and data
TRAFFIC CONTROL PLAN (Proposed)	37	Construction signing, TCP details
TEXT	38	Plan text and dimensioning
SIGNING & PAVEMENT MARKINGS (Proposed)	39	Permanent signing, delineators, pavement markings, road closure
SIGNALS (Proposed)	40	Railroad protective devices & switches; traffic signal features of signal heads, controllers & junction boxes
SIGNAL DETECTION (Proposed)	41	Vehicle loop detection, junction boxes, conduit
STREET LIGHTING (Proposed)	42	Luminaires, lighting features
CURBING (Proposed)	43	Curb & gutter, sidewalks, urban & rural approaches, raised channelization
FENCING, GUARDRAIL, & RETAINING WALL (Proposed)	44	Fencing, gates, cattle guards, guardrail, retaining walls
LANDSCAPING (Proposed)	45	Plans and appropriate text
DRAINAGE & STRUCTURES (Proposed)	46	Pipes (including arches & siphons), ditches, special ditches and grades, catch basins, manholes, embankment protector, minor structures, underdrains, pipelines (sanitary, storm & irrigation)
HYDROLOGY (Proposed)	47	Channel changes, wetland data, riprap
UTILITY FEATURES (Proposed)	48	Pipelines (gas, oil & water), utility manholes, wells, fire hydrants, meters, valves, risers, underground cable & conduit, utility poles, junction boxes, mailboxes
(Not Assigned)	49	
CADD INFORMATION	50	File information, special instructions
ALTERNATIVE ALIGNMENTS	51 52 53 54 55 56	"A" Alignment & Surface 1 "B" Alignment & Surface 2 "C" Alignment & Surface 3 "D" Alignment & Surface 4 "E" Alignment & Surface 5 "F" Alignment & Surface 6
"AS CONSTRUCTED" PLAN CHANGES	57 58 59 60 61 62	Alignments and grades Hydrology Approaches and Right of Way Utilities Bridges Miscellaneous

SECTION 815.00 – LETTER SIZES AND LINE WIDTHS

Maintaining the minimum letter height and letter stroke width is very important so that information does not disappear or become illegible when plan sheets are photocopied or reduced. The recommended requirements are as follows:

CADD SYSTEM METRIC TEXT GUIDE				
(Standard Sheet)				
Scale	1.5 mm	2.0 mm	2.5mm	3.0 mm
1m=50m	0.075 meter	0.100 meter	0.125 meter	0.150 meter
1m=200m	0.300 meter	0.400 meter	0.500 meter	0.600 meter
1m=500m	0.750 meter	1.000 meter	1.250 meter	1.500 meter
1m=1000m	1.500 meter	2.000 meter	2.500 meter	3.000 meter
1m=2000m	3.000 meter	4.000 meter	5.000 meter	6.000 meter
1m=4000m	6.000 meter	8.000 meter	10.000 meter	12.000 meter
1m=5000m	7.500 meter	10.000 meter	12.500 meter	15.000 meter

Drawing notes should normally be a combination of uppercase and lowercase lettering. Using all uppercase lettering for drawing notes is also acceptable. Uppercase lettering is desirable for all drawing titles.

SECTION 817.00 – NOTE PLACEMENT

Notes and lettering on plan sheets should be readable from either the bottom or right-hand edge of the sheet. Vertical lettering, approximately perpendicular to the bottom of the sheet, should be upright in relation to the right-hand edge of the sheet. All other lettering should be upright in relation to the bottom of the sheet.

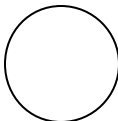
SECTION 820.00 – PLAN SHEET NOTE SYMBOLS

Callouts on the plan sheets that make reference to notes or further information shall use the following standards:

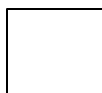
SYMBOL



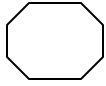
Ovals designate the pay item callouts. (Numbers to reflect bid items and/or special provision items. Use the pay item number.)



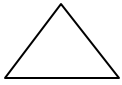
Circles may be used for notes.



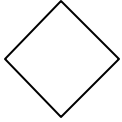
Squares designate curve data. (Start with number 1 and increase by increments of 1. Number each sheet separately.)



Octagons designate property ownership. (Number according to right of way information.)



Triangles designate revisions to the plans. (Start with number 1 and increase by increments of 1. To be used only during Contract Advertising submittal by Roadway Design.)

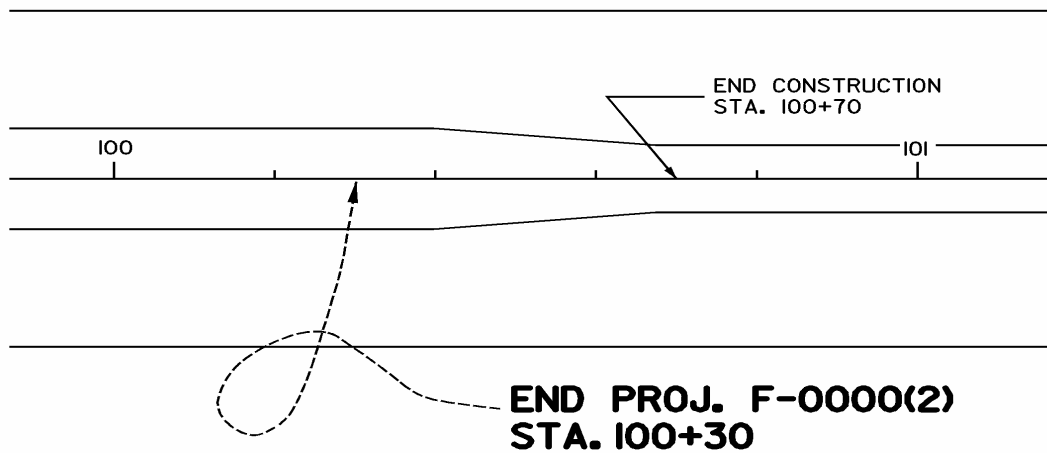
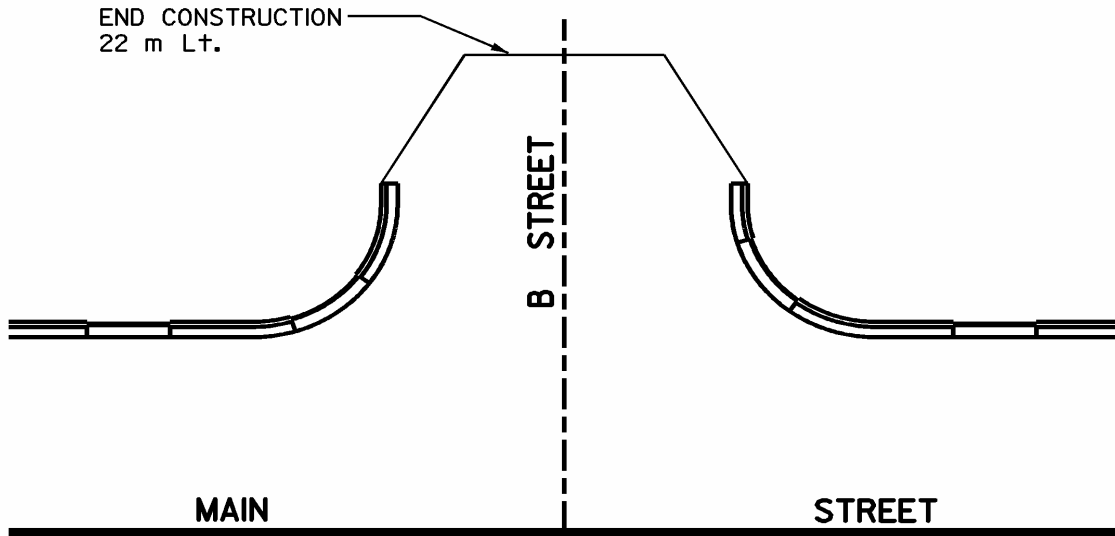


Miscellaneous items to be determined by the designer.

Cell size of symbols ($d = .4$ and $text = .14$)

SECTION 823.00 – ROADWAY TRANSITIONS

The termination of a roadway project usually involves a segment where the roadway width is varied to connect the new roadway pavement with the other existing roadway pavements. This connecting segment of pavement shall be appropriately labeled on the plan sheets as "BEGIN CONSTRUCTION" and "END CONSTRUCTION." The appropriate plan sheet notations are as follows:



SECTION 825.00 – MILE POSTS

Mileposts shall be indicated on the roadway plans both by numeric sequence and appropriate roadway stationing. The Title Sheet shall note the milepost for the beginning and end of the project with the appropriate road segment code.

When the centerline length of the project differs from that of the existing route, a milepost equation will be required on the plans with the appropriate roadway stationing. The following guidelines are provided for the determination of the appropriate milepost equations:

- *Beginning of Project:* Milepost equations will be used at the beginning of a project when a series of successive roadway realignment projects are to be constructed during different fiscal years in decreasing milepost order.
- *End of Project:* Milepost equations will be used at the end of a project on an isolated realignment project or where a series of successive roadway realignment projects are to be constructed during different fiscal years in increasing milepost order.
- *Minimum Realignments:* On projects with only a minimum of realignment, a milepost equation shall not be used unless the effective change in centerline length exceeds 20 meters 0.02 kilometers. This reduces the number of milepost equations and retains the historical data on previous roadway segments.

SECTION 830.00 – TITLE SHEET

A title sheet must be created by the District prior to the preliminary design review. The ITD MACS ROSE files contain roadway historical data, if needed, relative to project designations and beginning and ending locations. The data required to complete the title sheet (see [Figure 8-1](#)) are as follows:

- **Project Number Designation**
 - Add the project number to the main heading.
 - Add the project number to the title block. If there are different project numbers for Preliminary Engineering, Right of Way, or Construction, show all of the project numbers on the title sheet but only the Construction number on the remaining sheets.
 - Add the key number and county name to title block.
 - Add the project number, project location, and roadway segment code to the state map.
- **Index of Plan and Profile Sheets (include all prepared sheets)**
 - List the sheets in sequential order. Similar sheets (typical sections, summaries, plans, and profile) can be grouped together. Only Utility plans, Right of Way plans, and Bridge drawings may have separate numbering. See [Section 807.03](#) for the order of plan sheets.
 - Expand the size of the index box as needed.
- **Bridge Drawings**
 - List Bridge drawings with the appropriate drawing numbers either consecutively with the other drawings or separately numbered by the Bridge section.
- **Standard Drawings**
 - Determine which Standard drawings are required and list separately under the index box or use the Standard Drawing Index Sheet in [Appendix C](#) and mark the appropriate drawings.
- **Date Title Sheet**
 - Use the month and year nearest to the PS&E submittal date of the plans.
- **Scales**
 - Show graphically (bar scale s) the scales used on the plan and profile sheets.
- **Project Limits** (on the vicinity map, show project limit designations)
 - Show project limits by brackets (make project limits stand out).
 - Show stationing of project limits.
 - Black in route and project area.

- **Locate Sources on Vicinity Map**
 - Locate materials sources and show pit numbers.
 - Show stockpile sites (if included in project).
 - Show any other sites applicable to the project.
- **Design Designation**
 - Obtain the latest design designation data and add this information to the title sheet.
- **Total Sheets**
 - Determine the actual number of sheets (may be exclusive of the Utility plans, Right of Way plans, or Bridge drawings) and add to the title block.

SECTION 835.00 – MAPS AND EXHIBITS

A vicinity sketch map is a multipurpose, small-scale plan or map showing the entire project. The vicinity map shown on the Title Sheet may be all that is needed on some projects. If a separate vicinity sketch map is necessary to show more detail or for a road closure and maintenance segment, the map may be a copy of the total ownership map, a section of county map, a specially drawn map, or any other type of map that shows the entire project on a realistic scale.

Where a Road Closure and Maintenance Exhibit is required to show an entire project, then that exhibit can be used as the Vicinity Sketch Map and included in the plans. Data on the preparation of the exhibit for the Road Closure and Maintenance Agreement are covered in [Section 450.00](#).

A Total Ownership Map must be prepared for the Right of Way portion of the plans. The Total Ownership Map can be included in the project plans in lieu of the Vicinity Sketch Map.

SECTION 840.00 – TYPICAL SECTION SHEETS

Typical sections for roadways, approaches, frontage roads, streets, curbs, gutters, medians, channels, dikes, and other appropriate cross sectional data must be shown. These illustrations are to be completed with station limits, dimensions of widths, and depths of material to be constructed. Overall widths on typical sections shall be shown to the nearest tenth of a meter. Intermediate widths for separate types of base, etc., may also be shown to the nearest full tenth of a foot (meter). Thickness of various courses shall be established to the nearest millimeter, which is the basis for all computations and construction operations. The District shall review Materials Reports to ensure that all design features are correct and complete on the Typical Sections.

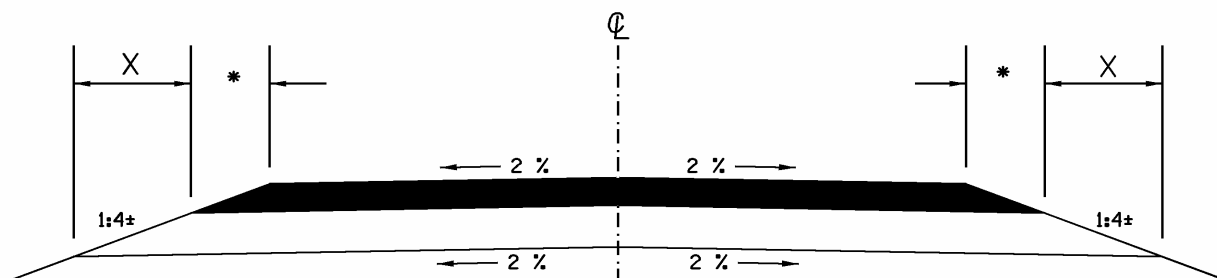
Progressive instructions for completing the Typical Section Sheets are as follows:

- **Typical Roadway Sections**
 - Draw sections at a size that is easily readable.
 - Show the station limits ABOVE each typical section to include transition stations.
 - Dimension clearly to the nearest tenth of a foot (meter) overall width from finished shoulder to subgrade shoulder. Dimension clearly to the nearest tenth of a foot (meter) intermediate widths for separate courses.
 - Specify roadway crown slopes (in percent slope).
 - Specify fore- and back-slopes and Standard Drawing Number.
 - Denote location of "Profile Grade" and/or Control Line.
 - Show any special ditch treatment.
 - Specify minimum ditch depths.
 - Show "Basic" right of way widths.
 - Specify median treatment, if any.

- Dimension clearly the depth of the various courses of material using multiples of hundredth of a foot (10 mm). Show construction fabrics. State the class and number of courses of plantmix.
- Black in or highlight pavement courses that are different from Base Courses.
- Show lane and paved shoulder widths to the nearest tenth of a foot (meter).
- Show "Seal Full Width" if appropriate.
- **Quantities**
 - Quantities for base and surfacing must be computed from the approved Project Materials Report.
 - Compute base and surfacing, rounding up to the nearest ton per station.
 - Surfacing quantities for plantmix shall include additives in the t/Sta. figures.
 - List the base courses by type of material for each layer of the base. For example: 0.4' compacted ¾" (120 mm compacted 19 mm) Aggregate Base Estimated at 150 T/Sta.(243 t/Sta.)
 - See [Figure 8-2](#) for the standard methods of computing quantities of various bid items.
- **Title Blocks**
 - Add title block information.
 - Show drafter's or designer's name and the date in the title block.
- **Notes**
 - Typical section and estimating notes, when placed on the typical sheets, are to be placed on the right-hand side of the sheet (see [Figure 8-3](#)).
 - The Phase 3 Materials Report should be used as a reference for estimating notes.

STANDARD METHODS OF COMPUTING QUANTITIES

TYPICAL SECTION COMPUTATION



TYPICAL CROWN SECTION

- Step 1: Choose foreslope width for plant mix pavement, [Subsection 405.03](#) of the 1999 State Standard Specifications: on initial pavement placement, 0.45 meter for plant mix pavement thickness of 0.20 feet (60 mm) or less; 2 feet (0.6 m) for plant mix pavement thickness greater than 0.20 foot (60 mm).
- Step 2: Calculate X distance. X distance is to be rounded to the nearest tenth of a meter; for distances less than 0.5' (0.05 m) round down and distances equal to or greater than 0.5' (0.05 m) round up. Tables are furnished showing foreslope widths for various material depths.

$$X = \frac{\text{Depth of material at foreslope}}{\text{Algebraic difference of foreslope and crown slope}}$$

Example: Depth of material at foreslope (150 mm base plus 300 mm rock cap) is 450 mm; foreslope slope is 1:4 or 0.250 m/m; crown slope is 0.020 m/m.

Calculate X Distance: $X = 0.450 \div (0.250 - 0.020) = 0.450 \div 0.230$
 $= 1.96$ (round to 2.0)

Step 3: Calculate foreslope width for base: $0.150 \div (0.25 - 0.02) = 0.65$ (round to 0.7 m)
 Calculate foreslope width for rock cap: $0.3 \div (0.25 - 0.02) = 1.30$ (round to 1.3 m)

For this example, assume the following information from the Phase 3 Materials Report:

19 mm Aggr. at 2320 kg/m³ for Plant Mix Pavement including Asphalt & Additives.

19 mm Aggr. at 2310 kg/m³ for Base including 7% water.

Rock Cap at 2210 kg/m³.

The following formula calculates metric tons per station:

$$t/\text{Sta.} = \text{Average width} \times \text{Depth (in meters)} \times \text{Length (100 meters per station)} \times \text{Mass Density (in kg/m}^3\text{)} \times 0.001$$

metric tons per kilogram

A simpler version of this is:

$$t/\text{Sta.} = \text{Average width (meters)} \times \text{Depth (mm)} \times \text{Mass density (kg/m}^3\text{)} \times 0.0001$$

90 mm Plant Mix Pavement

$$(5.1 + 5.7)/2 \times 90 \times 2320 \times 0.0001 = 112.75 \text{ t/Sta.}, \text{ round to } 115$$

150 mm Comp. 19 mm Aggr. for Base

$$(5.7 + 6.4)/2 \times 150 \times 2310 \times 0.0001 = 209.63 \text{ t/Sta.}, \text{ round to } 210$$

300 mm Rock Cap

$$(6.4 + 7.7)/2 \times 300 \times 2210 \times 0.0001 = 467.42 \text{ t/Sta.}, \text{ round to } 465$$

Choose foreslope width for plant mix pavement, Subsection 405.03 of the 1999 State Standard

Specifications: 0.45 m for plant mix pavement thickness of 60 mm or less;

0.6 m for plant mix pavement thickness greater than 60 mm.

FORESLOPE WIDTH OF X, BASED ON 1:4 FORESLOPE WITH 2% CROWN (METRIC)				
Depth of Material (mm)	Width of X (meters) (rounded)		Depth of Material (mm)	Width of X (meters) (rounded)
100	0.4		500	2.2
150	0.7		550	2.4
200	0.9		600	2.6
250	1.1		650	2.8
300	1.3		700	3.0
350	1.5		750	3.3
400	1.7		800	3.5
450	2.0			

Choose foreslope width for plant mix pavement, [Subsection 405.03](#) of the 1999 State Standard

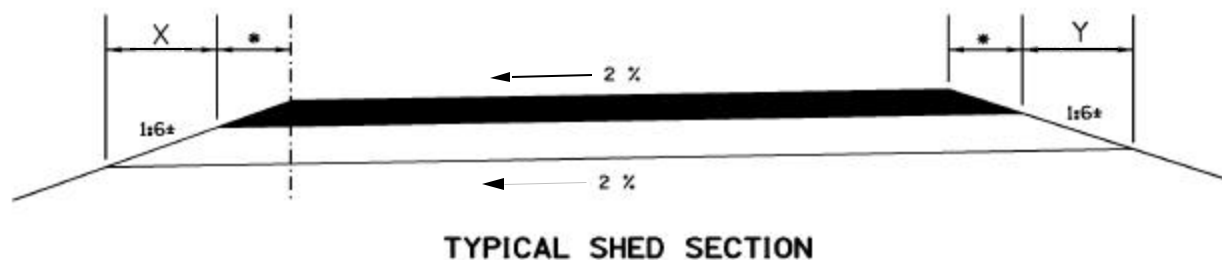
Specifications: 0.45 m for plant mix pavement thickness of 60 mm or less;

0.6 m for plant mix pavement thickness greater than 60 mm.

$$X = \frac{\text{Depth of material at foreslope}}{\text{Algebraic difference of foreslope and crown slope}}$$

$$Y = \frac{\text{Depth of material at foreslope}}{\text{Algebraic sum of foreslope and crown slope}}$$

Figure 8-2
(continued)



TYPICAL SHED SECTION

FORESLOPE WIDTH OF Y, BASED ON 1:6 FORESLOPE WITH 2% CROWN		(METRIC)	FORESLOPE WIDTH OF X, BASED ON 1:6 FORESLOPE WITH 2% CROWN	
Depth of Material (mm)	Width of Y (meters) (rounded)		Depth of Material (mm)	Width of X (meters) (rounded)
100	0.5		100	0.7
150	0.8		150	1.0
200	1.1		200	1.4
250	1.3		250	1.7
300	1.6		300	2.0
350	1.9		350	2.4
400	2.1		400	2.7
450	2.4		450	3.1
500	2.7		500	3.4
550	2.9		550	3.7
600	3.2		600	4.1
650	3.5		650	4.4
700	3.7		700	4.8
750	4.0		750	5.1
800	4.3		800	5.4

To obtain Y values for depths not listed, multiply depth of material (mm) by 0.00536 and then round to nearest tenth (0.1 m).

For 1:4, multiply by 0.00370.

To obtain X values for depths not listed, multiple depth of material (mm) by 0.00682 and then round to nearest tenth (0.1 m).

For 1:4, multiply by 0.00435.

- **Notes for Second Typical Section Sheet**
 - Notes are needed on other Typical Section Sheets only if there are special notes required for Typical Sections shown on those specified sheets.
- **Method of Computing Typical Section Quantities**
 - [Figure 8-2](#) gives a progressive method for the computation of ballast materials to be placed on the roadway. The following provides guidelines that will eliminate recomputation of quantities at various design stages:
- Subgrade section width (X & Y distances) is to be to the nearest tenth of a meter.
- Base material is to be computed in metric tons (megagrams) per 100 meter station, rounding to the nearest 5 metric tons per station.
- Bituminous and shoulder material is to be computed in metric tons (megagrams) per 100 meter station, rounding to the nearest 5 metric tons per station.

SECTION 845.00 – PROJECT CLEARANCE SUMMARY SHEET

All project clearances are to be verified by the Roadway Design section as part of the Final Project Approval. The ITD-1753, Project Clearance Summary, is used to make a permanent plan record of those clearances. The Project Clearance Summary provides a record and reference for clearances when a legal challenge occurs after the project is under contract.

The use of a rough draft of the summary by the designer to record clearances as they are obtained in project development eliminates lengthy file searches. Use the date column is for the date of the letter or approval document from the approving agency. In the case where a specific person has responsibility for approval, the date of that approving signature, if shown on the document, is the date to be recorded on the summary. Hearing dates shall be the date when the hearing was held.

TYPICAL SECTION SHEET NOTES**Notes**

Project combination adjustment factor is _____.

Class _____ compaction specified.

Estimating Basis

Reconditioning: Reconditioning is required from Sta. _____ to Sta. _____.

Water for Reconditioning will be _____ cubic meters.

Excavation of Soft Spots is required between Sta. _____ and Sta. _____.

Treated Base: _____ Asphalt for _____ (Plant Mix., Road Mix) Base Course at _____% by weight.

Source _____ Lab No. _____.

Cement for Cement Treated Base at _____% by weight.

_____ % Hydrated Line Filler.

_____ Asphalt for Curing Seal at _____ L/m².

Blotter Material at _____ kg/m². Source _____.

Cover Coat Material Type _____ at _____ kg/m². Source _____.

Tack and Prime: _____ for Prime at _____ L/m².

_____ for Tack at _____ L/m².

Blotter Material at _____ kg/m². Source _____.

Surface Treatment: Type _____ Surface Treatment.

First Application _____ at _____ L/m².

Blotter Material at _____ kg/m². Source _____.

Cover Coat Material Type _____ at _____ kg/m². Source _____.

Second Application _____ at _____ L/m².

Cover Coat Material Type _____ at _____ kg/m². Source _____.

Third Application _____ at _____ L/m².

Cover Coat Material Type _____ at _____ kg/m². Source _____.

Paving: _____ for Road Mix at _____% and Additives at _____% by weight. Source _____ Lab No. _____.

_____ for Plant Mix at _____% and Additives at _____% by weight. Source _____

Lab No. _____.

Concrete Pavement using Coarse Aggregate Size No. 3.

Source _____ Lab No. _____.

Seal: _____ for Seal at _____ L/m².
 Cover Coat Material Type _____ at _____ kg/m². Source _____.
 _____ for optional Fog Coat at _____ L/m².
 Blotter Material at _____ kg/m². Source _____.

Aggregate: Size, Est. Aggregate Compacted mass density (kg/m³), including additions.

_____ "Aggr. at _____ kg/m³ for Base, including _____% Water. Lab No. _____.
 _____ "Aggr. Type B at _____ kg/m³ for Cement Treated Base, including _____%
 Water. Lab No. _____.
 _____ "Aggr. at _____ kg/m³ for Road Mix Pavement, including 4% Water*. Lab No. _____.
 _____ "Aggr. at _____ kg/m³ for Plant Mix Base, including Asphalt and Additives.
 Lab No. _____.
 _____ "Aggr. at _____ kg/m³ for Plant Mix Pavement, including Asphalt and
 Additives. Lab No. _____.
 Blotter Material at _____ kg/m³. Source _____.
 Reject Material at _____ kg/m³. Source _____.
 Cover Coat Material at _____ kg/m³ (loose weight). Source _____.

Base, prime, surface treatment, plant mix, seal coat, etc., quantities have been increased on the Roadway Summary to construct gores, islands, approaches, and (other).

**Add the 4% water to Summary Quantities ONLY - Use Dry Weight metric tons per 100 meter station (t/Sta.) on Typical Section.*

SECTION 850.00 – PLAN SUMMARY SHEETS

To summarize the project plan, the following project plan summary sheets are available on the CADD only. Contact Engineering Support for information.

<i>ITD-1764</i>	<i>Roadway Summary</i>
<i>ITD-2178</i>	<i>Bridge Summary</i>
<i>ITD-1754</i>	<i>Pipe Culvert Summary</i>
<i>ITD-1755</i>	<i>Pipe Siphon Summary</i>
<i>ITD-1756</i>	<i>Irrigation Pipe Summary</i>
<i>ITD-1757</i>	<i>Sewer Pipe Summary</i>
<i>ITD-1758</i>	<i>Pipe Underdrain Summary</i>

The ITD-1764, Roadway Summary, should be prepared separately for each designated project in the set of project plans. The title block and name of persons compiling and checking data shall be indicated on the summary sheets. The sheet numbers for plan and profile with stations are shown in each column for items that are shown on the plan or profile sheets. The Item No., Item (description), and Unit of Measurement shall be compatible with the project bid schedule. **Abbreviations should be used only when necessary.** Totals can be used for any items that are uniform quantities from sheet to sheet, or totals for items that are calculated from the typicals such as base and pavement.

Any structures that are 6.1 meters or more span, as measured along the centerline, are classified as Bridges and should be listed separately on an *ITD-2178, Bridge Summary*. The Bridge summary sheets shall include quantities for the structure such as structural excavation, backfill, concrete steel, etc., with these quantities excluded from the roadway summaries. These project quantities will be furnished by the Bridge section upon completion of the bridge plans.

The pipe summary sheets (ITD-1754, ITD-1755, ITD-1756, ITD-1757, and ITD-1758) shall be completed for applicable types of pipe to be used on the project. Appropriate data shall be completed for the appropriate columns of the pipe summary sheets. The total pipe length by size should be noted in the total columns without reference to type of pipe material. The quantities for pipe installation such as structural excavation, backfill, concrete, catch basins, etc., should be included in the total for specific roadway summary items.

SECTION 855.00 – PLAN AND PROFILE SHEETS

The plan and profile for a project can be combined on a single plan sheet or separated on two sheets. The typical plan-profile sheets provide an example of how the project data should be presented on the project plans, should be used as guidelines for the design personnel, and periodically reviewed to reestablish the requirements.

Items on the profile shall be limited to profile and corresponding data, benchmarks and earthwork quantities (mass diagram), and showing installed pipes (locations and elevations without callouts).

Standard symbols should be representative of the feature, should indicate whether the item is existing or proposed, and should not need a note to explain the symbol.

Utility and right of way data may be shown on a separate set of plans.

Use item number ovals for identifying pay items, with all identical items referenced together on the right-hand side of the sheet. Future development of an automated estimate system on the CADD system will use this method. Construction items shall be indicated by a number or pay item and detailed with a corresponding number or pay item on the plan sheet only.

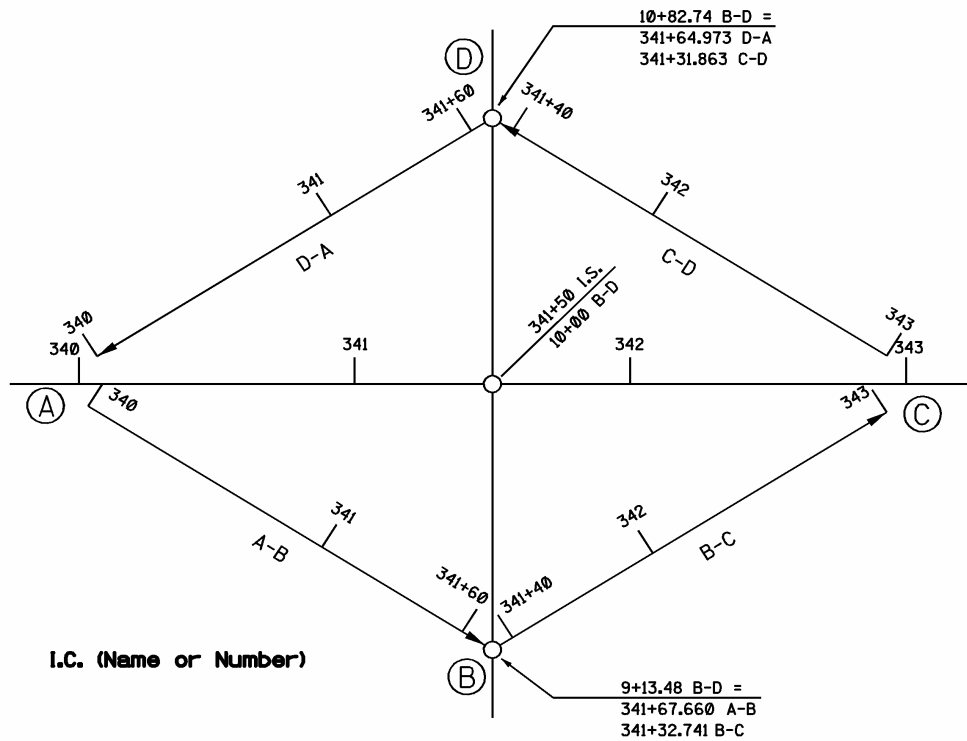
Non-pay items such as pipe removal shall be shown on the top portion of the plan sheet, but shall not be assigned a number.

Highlighted notes can be used to point out special requirements that have been overlooked in previous projects.

SECTION 860.00 – INTERCHANGE PLAN AND PROFILE

An adequate scale should be selected for the interchange to show all the interchange details while providing room for notes and control data. Several plan sheets may be required for an interchange; i.e., having a plan sheet for each half of the interchange and a sheet for the cross road with necessary profile sheets. Do not include details on the plan and profile for bridge and pipe data that is on the bridge plans and the pipe summary sheets.

The interchange should be referenced and stationed in accordance with the following diagram:



Stationing on the ramps is in the same sequence as the main Interstate Roadways. Stationing for ramps C-D and B-C are backed up from Interstate Station 343 at point C. The ramp survey control line is to be located on the inside ramp shoulder. The ramp beginning point is the intersection of the outside edge of the Interstate travelway and the ramp control line to eliminate unnecessary ramp stationing and allow better control of grade transitions to and from the ramps.

The ramp profile grades at the beginning or end of the ramps should be reviewed carefully relative to Interstate grade and shoulder slope that may cause grade sag. A straight-line grade transition from the ramp beginning or end, which is the Interstate grade, to the shoulder edge of the Interstate will eliminate this problem.

The ballast for the ramps is usually a different depth than for the Interstate. To simplify the ballast transition, the ballast depth for the Interstate can be carried along the ramp beyond the common point of the Interstate and ramp subgrade.

SECTION 865.00 – SIGNING AND PAVEMENT MARKING PLAN

Each roadway project requires traffic signing and roadway pavement marking plans even though the work may not involve federal-aid participation. If the work is to be performed by state forces, the use of state forces should be clearly noted on each plan sheet. Typical signing plan and signing erection specifications sheets are available as a preprinted sheet or from the CADD files. Other detail signing sheets, such as sign post details or sign legends, are available from the Traffic section.

SECTION 870.00 – MASS DIAGRAMS

Mass Diagrams are graphical and mathematical tabulations of project excavation, embankment, borrow, and haul quantities to guide placement of subgrade materials, determine the most economical distribution of subgrade materials, and provide estimates of project bid quantities. A Mass Diagram shall be prepared on each grading project, used in the determination of estimates, and provided to the Resident Engineer and Contractor for guidance during construction.

SECTION 875.00 – SOURCE PLAT

The plat and record is intended to furnish all the information required to establish the quality and quantity of material in the source, amount of overburden, required reclamation, and property ties and boundaries required for securing use of the source.

SECTION 880.00 – STANDARD DRAWINGS

Standard Drawings are prepared and maintained by the Roadway Design section. Most Standard Drawings are available on the CADD. Complete sets of all approved Standard Drawings are available upon request.

A project should be designed using a specific Standard Drawing as the standard the contractor shall use for that project. The Standard Drawing numerical designation (A-4) and Title (Rural Minor Collector Grading) shall be shown on the project Title Sheet or the Standard Drawing Index Sheet, inserted into the plans, and the required Standard Drawings marked.

Occasionally, projects have been designed with a specific Standard Drawing in effect with a revision occurring before the project goes to contract. This inconsistency causes confusion on construction and in some cases has resulted in unnecessary contract change orders or claims. Every effort should be made to provide Standard Drawings that reflect current design and construction practices and provides standard details that are used on recurring projects. The availability of CADD systems provides an opportunity to develop three dimensional views on Standard Drawings that give the inspector and contractor an improved visual illustration of the final product, reduce construction errors, and improve communication.

Suggestions and recommendations on new Standard Drawings or revisions are strongly encouraged. A sketch of the change or a marked-up existing drawing should be directed to the Roadway Design Engineer for approval.

It is now possible to plot the Standard Drawings locally for inclusion with plan sets. The procedure utilizes the Engineer's disclaimer rather than the signature. **This procedure can only be used with the current METRIC standard drawings!**

SECTION 885.00 – “AS CONSTRUCTED” PLANS

The original project plans are returned to the District when the project contract has been awarded for construction. A reduced set of project plans are retained and filed by the Roadway Design section as a permanent record of the project. These plans are used to document project design, construction activities, and modifications to the highway system in case of legal action, public inquiry, or other requests.

As the project is constructed, appropriate major revisions to the roadway such as extra lanes, added width, signalization, roadway illumination, additional right of way requisition, or spot major improvements need be indicated on existing plan sheets for "As Constructed" submissions. These submittals should show date of completion, revisions to roadway, and persons performing the work. A white print reflecting these changes should be forwarded to the Roadway Design section to update their master file of roadway plan sheets.

At the completion of each project, a set of "As Constructed" plans with the completion date shall be prepared by the Resident Engineer. All project corrections, revisions, and change order modifications shall be noted on these "As Constructed" plans. The "As Constructed" stamp shall be used after the changes are made.

Two sets of plan sheets (279 mm x 432 mm) must be provided to the Roadway Design section for filing the "As Constructed" plan sheets. If there is a structure on the project, one set will be forwarded to the Bridge Section. If the project plans were prepared on the CADD system, the changes shall be made on the project CADD file with the revised original drawings filed with the original project plans in the District and an "As Constructed" copy provided to Roadway Design. If the plans were manually drafted, they should be scanned and revisions made on the CADD system with a "As Constructed" copy provided to the Roadway Design section. Any questions on CADD file updates, revised project details, or record files should be directed to the Roadway Design Engineer.

The District Right of Way Agent shall provide a set of the “Official Right of Way” plans to the County Assessor following purchase and property revisions that occur during construction. Any property revisions or relocation of property access points shall also be indicated on the “As Constructed” plans. At the completion of the project, when all right of way monuments have been installed, a "record of survey" shall be filed with the respective County Recorder.

SECTION 890.00 – MAINTENANCE PROJECT PLANS

The size and the type of the maintenance project and work to be done will dictate the number of sheets that are used for each project. The sheet size for maintenance projects will be 215 mm x 279 mm or 279 mm x 432 mm prepared on durable paper. If the plans are to have more than six standard plan sheets (279 mm x 432 mm excluding standard drawings), then prepare a standard title sheet and place all data on standard sized plan sheets. Underground storage tank (UST) projects are an example of projects that will typically require standard sized plans. Each project shall include but shall not necessarily be limited to the following:

- **Sketch Map:** Portion of a county map showing the project area with the following information:
 - Source number with symbol, milepost (or equivalent), and highway name or number.
 - Stockpile number with symbol, site number, milepost (or equivalent), and highway name and number.
 - Bracketed project limits and milepost (or equivalent) of project.

- **Typical Sections:** Sufficient data to show how the project affects the existing roadway.
- **Summary of Quantities:** Use the same format as required for other projects (heading, etc.).
- **Sheets:** Number all project sheets.
- **Standard and Special Drawings:** List all Standard Drawings, Special Drawings, Reclamation Plat, etc., to give an account of sheets to be included in the project.

PLAN SHEET CHECKLISTS

SECTION 895.00 – PLAN SHEET CHECKLISTS

To ensure there are no errors or omissions, [Figure 8-4](#) can be used when checking the various plans prepared for a project.

PLAN SHEETS CHECKLIST

Project No. _____ Key No. _____ Date _____

Engineer's stamp, date, and signature are required on all sheets.

TITLE SHEET
 Complete Title Block.....
 Highway Number or Road Number.....
 Project No. and Key No.
 County or Counties.....
 Place and Date of Drawings
 Horizontal and Vertical Scales (shown graphically)
 State Map (upper right side) Showing Mileposts, Project Name and Road Segment Code.....
 Sheet Index Box (upper left corner).....
 List of Structure and Standard (including date) Drawings
 (upper left corner or on a separate sheet).....
 Design Designation.....

LAYOUT MAP (on Title Sheet or a separate Exhibit).....
 North Arrow.....
 Scale (shown graphically)
 Section, Township and County Lines.....
 General Course of Proposed and Present Road.....
 Town (with population), Railroads, Streams
 Station at Begin and End of Project.....
 Location of Project Materials Sources.....

VICINITY SKETCH MAP.....
 Complete Title Block.....
 Show Information for Road Closure and Maintenance Agreement
 Scale (shown graphically)
 Section, Township, City Limits
 Name of Towns (with current census), Railroads, Streams (with direction of flow).....
 Existing Road.....
 Begin and End of Project with Kilometer Post (Milepost) and Station Equation to
 Adjoining Projects.....
 Proposed Alignment

TOTAL OWNERSHIP MAP	_____
Complete Title Block.....	_____
Scale (shown graphically)	_____
Section, Township, City Limits	_____
Name of Towns (with population), Railroads, Streams (with direction of flow).....	_____
Existing Road.....	_____
Begin and End of Project with Kilometer Post (Milepost) and Station Equation to	
Adjoining Projects.....	_____
Proposed Alignment	_____
Ownership Tabulation (Parcel No., Owner's Name, Area of Ownership with Subtotals of New and	
Existing R/W, Remainders Left and Right, Permanent and Temporary Easements).....	_____
 CLEARANCE SUMMARY	_____
Complete Title Block.....	_____
Check all Clearances in Project Files.....	_____
Estimating Date, Class of Compaction, and Increased Quantity Note (or show on Typical Section	
Sheet)	_____
 TYPICAL SECTION SHEET	_____
Complete Title Block.....	_____
Check Phase 3 Materials Report	_____
Relation of Control Profile Grade Line and Survey Centerline	_____
Location of Profile Grade Same as Profile Sheets	_____
Dimensions Shown in Decimals of a Meter	_____
Show Location of Subgrade.....	_____
Crown and Shoulder Slope	_____
Depths of Compacted Ballast Materials	_____
Number of Plant Mix Courses and Class of Plant Mix	_____
Basic Right of Way Width.....	_____

ROADWAY AND BRIDGE SUMMARIES.....	_____
Complete Title Block.....	_____
Summary by Sheets, Headings for all Columns, Item Numbers.....	_____
Sheet Number, Stationing and Length of Each Sheet.....	_____
Pay Quantities from Other Summary Sheets.....	_____
Total Length in Meters to 3 Decimal Places, Bridges and Non-participation Items Separate	_____
Check Item Numbers and Nomenclature	_____
Bridge Summary Agrees with Situation and Layout Summary.....	_____
Separate Summaries are Required for each Fund Source (i.e., F, HES, etc.).....	_____
All Pay Quantities from Other Summary Sheets (Pipe, Structure, etc.).....	_____
Non-Participating Items Should have Separate Summary	_____
Check Summaries with Engineer's Cost Estimate.....	_____
 PIPE SUMMARIES.....	_____
Complete Title Block.....	_____
Check Phase 2 Materials Report	_____
Review that Acceptable Alternates are Shown.....	_____
 SOURCE PLAT.....	_____
Complete Title Block.....	_____
All Bearings and Distances are Shown.....	_____
Source Area to be Worked is Shown.....	_____
Test Holes are in or Around Area to be Worked.....	_____
Reclamation Plan Approved	_____
Note on Plat or in Special Provisions Whether or not Source Reclamation is Required.....	_____
Right of Way and Archeological Clearance.....	_____
Materials Engineer Should Stamp and Sign the Source Plat.....	_____
Material to be Obtained Includes Those Specified in Special Provisions	_____
Requirements (washing, blend sands, etc.) Included in Special Provisions	_____

PLANS	_____
Complete Title Block.....	_____
Check Review Letters (preliminary and final).....	_____
Check Horizontal Alignment for Standards	_____
Mark and Number Every Station - Mark Intermediate Stations at 20 Meter Intervals.....	_____
Equations of Stationing.....	_____
Bearings (check with adjacent projects).....	_____
Curve Data (Radius, Delta, Tangent, Length, Super, Z Distance, Runoff)	_____
Station at P.C., P.T. and Spiral Points	_____
Station and Deflection at Angle Points	_____
R/W Lines and Width of R/W at Breaks and Each End of Sheets.....	_____
R/W Symbol for Access and Easements (note purpose of easement)	_____
Utility Relocations Present and Proposed at Whose Expense	_____
Vertical Clearance of Utilities.....	_____
Railroads, Showing Name, R/W and Encroachments.....	_____
Fences	_____
Drainage Shown, Including Intermittent	_____
Buildings, Trees, Septic System, etc. (note removal items)	_____
Ditches, Canals, Streams, Lakes (names and direction of flow).....	_____
Station, Type, and Symbol of Drainage Structures (both proposed and existing)	_____
Channel Change, Small Ditches and Dikes	_____
Guardrail, Delineators, Riprap, Other Misc. Items.....	_____
Marshes and Swampy Ground, Cliffs and Bluffs.....	_____
Present Road, Showing Portion to be Obliterated.....	_____
Towns (Name-Limits-Names of Streets, Blocks, Pop., etc.).....	_____
Section Lines, Showing Corners Found and Section Ties	_____
Township and Range	_____
Section Subdivisions, Designations (as NE4 SW4 23 or Lot No.).....	_____
County Lines, State Lines, City Limits	_____
Stationing of Property Line Intersections and Easements.....	_____
Land Use and Ownership Parcel No. with Acreage Figures	_____
Approaches with Dimensions (check R/W Use Policy).....	_____

PLANS (continued)	_____
North Arrow.....	_____
Begin and End of Project with Kilometer Post and Station Equation to Adjoining Projects	_____
Project and R/W Markers	_____
R/W Widths Against X-Sections, Including Slope Rounding	_____
Show Limits of Cut and Fill Slopes.....	_____
If Multiple Funding Sources, Show Funding Break on Plans or by Narrative	_____
 PROFILE	_____
Complete Title Block.....	_____
Check Vertical Alignment for Standards	_____
Ground Line	_____
Indicate Grade Location (check typical section)	_____
Percentage of Grade (three decimal places)	_____
Special Ditch Grades	_____
Vertical Curve Data (length, elevations, stations).....	_____
Mark and Number Every Station - Mark Intermediate Stations at 20 Meter Intervals.....	_____
Equations of Stationing.....	_____
Grade Point Excavation and Backfill.....	_____
Structures (check station and grades)	_____
Benchmarks	_____
Begin and End of Project and Ties to Adjoining Project.....	_____
Excavation, Embankment, Borrow and Waste (sheet totals).....	_____
Haul Showing Placement	_____
Roadway Length (less bridge length)	_____
Embankment Foundation Compaction.....	_____
Depth and Location of Sub-Subgrading	_____
 BRIDGE SHEETS	_____
Complete Title Block.....	_____
Check Phase 4 Materials Report (Piles or Pile Points)	_____
Proper Transition of Guardrail to Bridge	_____
Standard Drawings Referenced Shown on Title Sheet.....	_____
Check Pay Quantities with Bridge, Situation/Layout Sheet, and Roadway Summaries.....	_____